

Here are the R commands to find probabilities and quantiles for the “named” distributions we have talked about. We consider discrete and continuous models.

DISCRETE MODELS: Binomial, geometric, negative binomial, hypergeometric, Poisson.

Model	$p_Y(y) = P(Y = y)$	$F_Y(y) = P(Y \leq y)$	ϕ_c
$Y \sim b(n, p)$	<code>dbinom(y, n, p)</code>	<code>pbinom(y, n, p)</code>	<code>qbinom(c, n, p)</code>
$Y \sim \text{geom}(p)$	<code>dgeom(y-1, p)</code>	<code>pgeom(y-1, p)</code>	<code>1+qgeom(c, p)</code>
$Y \sim \text{nib}(r, p)$	<code>dnbinom(y-r, r, p)</code>	<code>pnbinom(y-r, r, p)</code>	<code>r+nbinom(c, r, p)</code>
$Y \sim \text{hyper}(N, n, r)$	<code>dhyper(y, r, N-r, n)</code>	<code>phyper(y, r, N-r, n)</code>	<code>qhyper(c, r, N-r, n)</code>
$Y \sim \text{Poisson}(\lambda)$	<code>dpois(y, \lambda)</code>	<code>ppois(y, \lambda)</code>	<code>qpois(c, \lambda)</code>

NOTE: In discrete distributions, the c th quantile ϕ_c is taken to be the smallest value satisfying $F_Y(\phi_c) = P(Y \leq \phi_c) \geq c$. Note that $0 < c < 1$.

CONTINUOUS MODELS: Uniform, normal, exponential, gamma, χ^2 , beta.

Model	$F_Y(y) = P(Y \leq y)$	ϕ_c
$Y \sim \mathcal{U}(\theta_1, \theta_2)$	<code>punif(y, \theta_1, \theta_2)</code>	<code>qunif(c, \theta_1, \theta_2)</code>
$Y \sim \mathcal{N}(\mu, \sigma^2)$	<code>pnorm(y, \mu, \sigma)</code>	<code>qnorm(c, \mu, \sigma)</code>
$Y \sim \text{exponential}(\beta)$	<code>pexp(y, 1/\beta)</code>	<code>qexp(c, 1/\beta)</code>
$Y \sim \text{gamma}(\alpha, \beta)$	<code>pgamma(y, \alpha, 1/\beta)</code>	<code>qgamma(c, \alpha, 1/\beta)</code>
$Y \sim \chi^2(\nu)$	<code>pchisq(y, \nu)</code>	<code>qchisq(c, \nu)</code>
$Y \sim \text{beta}(\alpha, \beta)$	<code>pbeta(y, \alpha, \beta)</code>	<code>qbeta(c, \alpha, \beta)</code>

NOTE: In continuous distributions, the c th quantile ϕ_c satisfies $F_Y(\phi_c) = P(Y \leq \phi_c) = c$. Note that $0 < c < 1$.